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Featured Articles

The Impact of Virtualization

By Christopher J. Pinc

Savvy data center managers (DCMs) know that staying informed on upcoming industry trends is a crucial key to their success. Virtualization is one such just-around-the-bend trend that will impact their world in significant ways. So getting familiar with what virtualization is all about and why IT organizations will likely be taking advantage of it in the near future is essential.

What is Virtualization?

Virtualization refers to software that provides greater control over your servers by allowing multiple operating systems and certain applications to coexist on a single server. Virtualization allows the data center manager to better utilize existing and under-utilized servers, as well as more efficiently manage and allocate resources for applications. This software will help maximize the value of your infrastructure by decreasing server provisioning costs, resource management time and provisioning speeds.

In the world of the DCM, what is a good fit for virtualization? Underutilized servers, legacy systems, applications that require their own server, and non-IO intensive applications are the place to start. Applications that are disk-IO intensive, busy/highly utilized servers, and applications that require proprietary hardware are a poor fit for virtualization.

Virtual software technology provides a separation between applications and the hardware on which they are run. This means that individual servers can be configured and provisioned for multiple operating systems to support Windows, Linux, Unix and NetWare applications all on the same server. Much like SAN technology, server virtualization allows for increased flexibility and optimized hardware, a first step toward utility computing. And it gives DCMs the ability to react to new project requirements more quickly and manage control room infrastructures or planned outages more effectively. DCMs can also expedite the process of setting up lab environments. Data center efficiency is enhanced all around.

By creating a virtual separation of applications on the same server, data center managers can increase the 1:1 applications/server ratio to 5:1, 10:1 and possibly even more. In addition, virtualization software allows greater control over the allocation of server resources—such as CPU, memory, disk, Network Interface Card—that a particular application may require.

As you plan your 2006 data center needs, consider the myriad benefits of implementing virtualization software:

- Server utilization rates increase from 5 to 15% up to 60 to 80%
- New resources can be provisioned quickly and efficiently
- Provisioning times of new applications are shortened

- Change requests delivery times may be greatly reduced
- Hardware maintenance downtime is minimal
- Unified server provisioning, monitoring and resource allocation is possible across multiple generations of Windows, Linux and NetWare servers
- Migration or elimination of older, underutilized servers
- Increased success rates for rollouts of software patches
- Complete information on equipment counts and status updates can be captured

Data Center Issues

Data center managers constantly find themselves mulling over operational questions such as, “What is the longevity of my data center? How much more equipment can it support? Do I really need to budget for a UPS upgrade?”

Trying to evaluate and juggle current and future power capabilities, cooling and space requirements, and other operational factors occupies a good portion of their time. In an ideal world, keeping this balance of 20 balls in the air at once can be easily accomplished if all data center activity remained static. This, of course, is never the case. Business departments are continually changing their server requirements; new products/services add to server support needs; mergers & acquisitions can greatly impact a data center and its ability to support a company’s bottom line goals.

A recent April 2005 Interunity/AFCOM survey found that 59% of data center management respondents were worried about new equipment purchases that did not take into consideration power and cooling capacities. 73% were concerned with their lack of involvement in the planning and procurement of new equipment. And a sizable 45% believed their data centers could be insufficient to support business goals a mere two years out. Virtualization assuages these concerns by providing new answers to old problems.

After the explosion of applications and servers throughout the 1990s, data centers are now challenged to support all of these different servers. Many of the business applications required their own server for fear of the application failing when maintained on a box with others. These new servers are many times over-provisioned for growth, CPU and memory capacity. The effect was to leave many servers underutilized, while occupying more space, power, cooling and IT resources to support them. Ironically, this has happened in a time when IT budgets are constantly scrutinized and tightly squeezed.

As server counts increase, resulting in more complex networks, data center managers face persistent challenges, such as:

- Large over-provisioning caused by policies that size all servers for ‘worst-case’ workload scenarios
- Long provisioning cycle times for new servers, storage and networking
- Long delays between change request submission and operational changes

Software virtualization products are one method that may help mitigate these concerns and allow data center managers to gain better control of their facilities.

How Does the DCM Benefit?

Knowledge is king, and understanding how virtualization will enhance data center management is crucial. Virtualization software can help IT and data center managers both better manage existing systems and properly plan for future applications.

Many DCM concerns can be remedied by the implementation of virtualization. Space requirements for servers within the data center are positively impacted. Maximized utilization rates help mitigate server growth, and proper planning eases growth in power and cooling.

Virtualization is a coming industry trend that IT managers are now incorporating into their planning processes. So data center managers need to leverage this shift by being aware of the merits of virtualization and knowing the right questions to ask regarding how it will impact their data centers and accompanying space/power/cooling needs.

As we all recognize, data center space is very expensive to build and maintain. The top priority of data center managers is to ensure the availability of business-critical applications while maximizing data center efficiency. By knowing how virtualization software streamlines the functionality of a data center, both IT and data center managers can optimally operate their infrastructures, while providing more accurate forecasting and better overall return on investment.

Christopher J. Pinc is a founding partner of N'compass, a Minneapolis-based regional consulting firm specializing in strategic IT design, planning and maintenance of data center spaces and equipment. Chris can be reached at cpinc@ncompass-inc.com.